

Review of Grout Plan

Date:	28/05/2021			
Address:	John Hunter Hospital Development			
Our Ref:	EBA19-00149			
Report Title:	Grouting Assessment for the Proposed John Hunter Health and Innovation Project			
Report Ref:	RCA-002/2			
Report Date:	25/03/2021			
Report Author:	DgS			
Notes:	Review limited to Appendix A - Preliminary Grouting Works Specification			
Item No.	Section	Page	Item	SA NSW Comment
			Drilling methodology / requirements	
1			Drilling methods	Please include comment on bores are required to be cased to competent strata. Other drilling methodology requirements discussed are acceptable
2			Proposed grout borehole layout - spacing	Grout plan requires 'Pilot' bores spaced between 15m-20m commencing at 7.5 m distance from the extent of the target bord grout area. The plan states additional bores will probably be required in the midpoint between pilot holes (7.5m-10m) to inspect/verify grout heights. Due to the amount of 'goafing' or rubble encountered in the investigation bores, 15 m bore spacing is considered the maximum distance the pilot bores should initially be spaced. Shortening of borehole spacing, or the requirement for 'midpoint' bores, should be reviewed following the completion of grouting of the first few pilot holes and the verification of extent (Hold Point 2 conducted during works) to occur within five of the ten target grout bords (increased from three), at a minimum. If additional grout is required in any bords then the plan should describe a direction to drill additional midpoint bores in each bord at the site. It is noted that at some locations the proposed bore locations shown on Figure 6a appear to be spaced greater than 15m. The spacing of the bores should conform to the plan requirements.
3	A3.2	A4	QA - Drillers logs requirements	In addition to those stated, drillers logs are to include : Bore inclination and azimuth, Depth and thickness of any coal seams encountered, End Bore Depth
4			Borehole backfill requirements	All bores should be grouted to refusal at seam level and the borehole backfilled with grout to the surface. If open void space at workings level is to remain at the borehole location (i.e. bore not grouted to refusal), a risk assessment must be provided showing no risk of failure of the grout/plug installed within the borehole can occur and include a procedure for backfilling of boreholes. Where undertaken all parties (drilling contractor, grouting contractor and verification engineer) are to confirm the procedure was followed and the borehole is adequately sealed.
5	A3.1	A3	Camera / sonar requirements	All bores are also to inspected using downhole camera. Other requirements for sonar and borehole deviation are acceptable.
			Grout methodology / requirements	
6			General methodology	Acceptable. Any previous investigation boreholes which are not grouted should be sealed during grouting works.
7	A2.2	A2,A3	Batch design requirements	Acceptable - Contractor to provide mix constituents, UCS strength results, grout trials to confirm suitable lateral flow and segregation. When developing the methodology for the grout trials the current condition of the workings should be considered.
8			Grout sequence	Please include comment on grout sequence.
9	A3.3	A4	QA - Grouting	Flowcone range is considered appropriate for rubble filled voids where an ASTM flow cone is used. A consistency test is to be undertaken for each grout batch. An ASTM flow cone is commonly used in grouting works. UCS testing frequency is acceptable. Grout plan requires minimum 90-day Youngs Modulus of 900 MPa. No laboratory testing requirements are specified to confirm this. Please update.
10			Grout not meeting specification requirements	Please include hold point or comment on the procedure which is to be followed should the QA testing (frequency, flowcone results) not meet the plan requirements.
			Verification	
11	A3.5	A6	Verification bores	At a minimum, a set of verification bores (at midpoint and at extents) should be drilled in each bord (Bords A to J - Figure 6a)) Provide drawing showing indicative verification bore locations.